

## William (Will) Kraus

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### EDUCATION

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#### Carnegie Mellon University

*Master of Science in Mechanical Engineering - Research*

Pittsburgh, PA

May 2025

#### Pennsylvania State University

*Bachelor of Science in Mechanical Engineering, Minor in Engineering Leadership Development*

State College, PA

May 2023

### RESEARCH EXPERIENCE

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#### Graduate Researcher

2023 - Present

*Robotic Exploration Lab (REx Lab) at Carnegie Mellon University*

*Pittsburgh, PA*

- Fabricated a flexible satellite test platform to be controlled via reaction wheels and model predictive control
- Developing data-driven system identification of flexible structures using IMU and motion capture data
- Collaborating with graduate students to deploy model predictive path integral (MPPI) control on legged robots

#### Undergraduate Researcher

2022-2023

*Networked Robotic Systems Lab at Pennsylvania State University*

*State College, PA*

- Integrated A\* path planning research in MATLAB to mobile robot and motion capture system
- Developed wheeled base for an autonomous robot programmed for defense contractor research project
- Built 5 mobile robots using Arduino microcontrollers and Nvidia Jetson boards for interdisciplinary research

### PROJECTS

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#### Autonomous Vehicle Control Across Simulation Environments | ROS, Gazebo, Webots, Control Systems 2023

- Developed control systems (PID, LQR) and A\* lane change algorithm in Webots simulation environment
- Achieved 33% faster track speed over PID with < 3.5 meter average distance from road median
- Transferred controller and data collection into ROS framework and Gazebo to demonstrate compatibility across different simulation environments

#### Drone Surveillance of Autonomous Vehicle Test Track | Python, Computer Vision, International Teams 2023

- Led 11 students from Chalmers University and Pennsylvania State University to program a drone in Python to detect fence breaches at AstaZero autonomous vehicle research facility in Sweden
- Guided project development of 3 key software deliverables: view fence from a top-down perspective, identify fence breaches from intrusions, and store video feed for further review
- Presented deployment results and poster of project that saves employees 2 hours/month to industry professionals
- Awarded Lockheed Martin First Place for Best Project among hundreds of teams

#### Penn State Robotics Club President | Humanoid Robotics, Leadership

2021 - 2023

- Founded 5 foot humanoid robot project using ROS simulation and VR control input for cancer charity event
- Spearheaded manufacturing of over 20 metal and plastic humanoid parts with software and hardware teams
- Expanded club from 6 members over pandemic to 60 members working on semester-long robotics competitions

### WORK EXPERIENCE

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#### Engineering Intern (Vibration Analyst)

June 2022 - August 2022

*KCF Technologies*

*State College, PA*

- Analyzed data to detect root causes of equipment failures of industrial machinery
- Interfaced with 6 different industrial customers across the United States for customer support and problem solving
- Presented integration plan for sensors on FANUC industrial robots in automotive factory into machine health platform by timing sensor collection windows to industrial robot G-code

### SKILLS

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**Programming:** Python (Matplotlib, Numpy, Scipy), MATLAB/Simulink, ROS/ROS2, C++, Linux, Julia

**3D Modeling / Simulation:** Autodesk Fusion 360, SolidWorks, Blender, Abaqus, Webots, Gazebo

**Hardware:** Rapid Prototyping, 3D Printers, Mills, Lathes, CNC, GD&T, Soldering